

In the Claims:

1 1. (Currently amended) An apparatus for producing water on
2 board of an aircraft while using one or more fuel cells,
3 comprising at least one high temperature fuel cell that has
4 an anode side and a cathode side and that is integrated
5 into a heat-producing arrangement of an aircraft engine,
6 wherein the heat-producing arrangement optionally
7 additionally includes at least one combustion chamber,
8 wherein the high temperature fuel cell is adapted to carry
9 out a fuel cell process and the optional combustion chamber
10 is adapted to carry out a combustion process, characterized
11 in that:

12 the high temperature fuel cell is an oxide ceramic
13 fuel cell (SOFC - solid oxide fuel cell), or a molten
14 carbonate fuel cell (MCFC), or a fuel cell that has a power
15 and temperature level equivalent to an oxide ceramic fuel
16 cell or a molten carbonate fuel cell;

17 the apparatus includes a hydrogen supply that
18 comprises a source of liquid or gaseous hydrogen and that
19 is arranged and adapted to supply pure hydrogen to the
20 anode side of said high temperature fuel cell;

21 an air intake is arranged and adapted to supply air to
22 the cathode side of said high temperature fuel cell;

23 the hydrogen supply and the air intake are further
24 arranged and adapted to supply a mixture of hydrogen and
25 air to the combustion chamber;

26 at least the hydrogen supply is constructed for a
27 closed loop control or can be shut off completely; [[and]]
28 the apparatus further includes a liquid hydrogen

29 evaporator positioned upstream of the high temperature fuel
30 cell or the combustion chamber; and

31 the apparatus further includes a single stage or
32 multistage turbine (16) connected downstream of the anode
33 side of the high temperature fuel cell, said turbine
34 adapted to convert thermal energy of anode exhaust gas (35)
35 into rotation energy.

1 2. (Original) The apparatus of claim 1, characterized in that
2 the conversion of the thermal energy takes place by a
3 Stirling motor and/or by one or more combinations of
4 different thermal engines, for example a turbine and a
5 Stirling motor.

Claims 3 to 24 (Canceled).

1 25. (Previously presented) The apparatus of claim 1, comprising
2 a compressor (13) and means for supplying gained mechanical
3 energy to said compressor.

1 26. (Previously presented) The apparatus of claim 25, wherein
2 said compressor is used for charging said anode side of
3 said high temperature fuel cell (7) with hydrogen (15)
4 under pressure.

1 27. (Previously presented) The apparatus of claim 1, further
2 comprising a condensation process (18) connected downstream
3 of said high temperature fuel cell or high temperature fuel
4 cells (7), said condensation process condensing water out
5 of a portion of anode exhaust gas (35) of said fuel
6 cell (7).

1 28. (Currently amended) The apparatus of claim 1, wherein said
2 high temperature fuel cells (7) are cell is constructed for
3 pressurizing the air or oxygen side, and the fuel or
4 hydrogen side, whereby equal or different pressures are
5 permissible on the anode side and on the cathode side.

Claims 29 and 30 (Canceled).

1 31. (Currently amended) The apparatus of ~~claim 30, claim 1,~~
2 further comprising an anode exhaust gas condenser (18) and
3 wherein said evaporator (17) is constructed to be operable
4 by process heat of said anode exhaust gas condenser (18).

1 32. (Previously presented) The apparatus of claim 31, wherein
2 said evaporator (17) is constructed as a pipe bundle heat
3 exchanger which is arranged as a ring shape around said
4 condenser (18) or circularly within said condenser (18).

1 33. (Previously presented) The apparatus of claim 31, wherein
2 at least a portion of said condenser (18) is operable with
3 cooling air (19).

Claims 34 and 35 (Canceled).

1 36. (Previously presented) The apparatus of claim 1, wherein
2 produced steam is blown in upstream of a second turbine
3 stage (9) of said multistage turbine where said steam is
4 mixed with cathode exhaust air.

Claim 37 (Canceled).

1 38. (Currently amended) The apparatus of claim 1, claim 27,
2 further comprising means for withdrawing water of distilled
3 quality from [[a]] the condensation process (18) and for
4 distributing said distilled quality water, a salination
5 station [[(23)]] (43) for adding a dose of salt to produce
6 drinking water for galleys, hand wash basins and showers
7 and for supplying distilled water to toilets and
8 humidifiers.

1 39. (Currently amended) The apparatus of claim 1, wherein said
2 multistage turbine comprises turbine stages (8, 9) for
3 driving compressor stages (5, 6) and a fan (11), and
4 wherein the compressor stages (5, 6) pressurize an air side

5 of said high temperature fuel [[cells]] cell (7) and of
6 said combustion chambers chamber (7A).

1 40. (Previously presented) The apparatus of claim 39, wherein
2 an air throughput (3) of said fan (11) is used either in an
3 engine for propulsion or in an APU for pressurization of
4 pressurized air systems and/or of an air conditioning
5 system.

1 41. (Previously presented) The apparatus of claim 39, wherein
2 said fan (11) is coupled with a first compressor stage (6)
3 and with the second turbine stage (9), and wherein a second
4 compressor stage (6) and the first turbine stage (8) are
5 coupled with each other and run on coaxial shafts with
6 different revolutions per minutes.

1 42. (Previously presented) The apparatus of claim 41, wherein
2 the number of coupled compressor stages and turbine stages,
3 the direction of rotation of these stages, and the number
4 of coaxial shafts rotating one within the other are
5 constructed at discretion.

Claim 43 (Canceled).

1 44. (Previously presented) The apparatus of claim 1,
2 constructed for being operable without supplying water to
3 a water system.

1 45. (Currently amended) The apparatus of claim 1, wherein said
2 at least one combustion chambers chamber and said at least
3 one high temperature fuel [[cells]] cell are operable
4 separately and in any desired combination.

1 46. (Previously presented) The apparatus of claim 1, wherein
2 individual combustion chambers or high temperature fuel
3 cells are adapted to be switched off for a separate
4 operation of combustion chambers or high temperature fuel
5 cells.

1 47. (New) An apparatus for producing water on board of an
2 aircraft while using one or more fuel cells, comprising at
3 least one high temperature fuel cell that has an anode side
4 and a cathode side and that is integrated into a
5 heat-producing arrangement of an aircraft engine, wherein
6 the heat-producing arrangement optionally additionally
7 includes at least one combustion chamber, wherein the high
8 temperature fuel cell is adapted to carry out a fuel cell
9 process and the optional combustion chamber is adapted to
10 carry out a combustion process, characterized in that:

11 the high temperature fuel cell is an oxide ceramic
12 fuel cell (SOFC - solid oxide fuel cell), or a molten
13 carbonate fuel cell (MCFC), or a fuel cell that has a power
14 and temperature level equivalent to an oxide ceramic fuel
15 cell or a molten carbonate fuel cell;

16 the apparatus includes a hydrogen supply that is
17 arranged and adapted to supply pure hydrogen to the anode
18 side of said high temperature fuel cell;

19 an air intake is arranged and adapted to supply air to
20 the cathode side of said high temperature fuel cell;

21 the hydrogen supply and the air intake are further
22 arranged and adapted to supply a mixture of hydrogen and
23 air to the combustion chamber;

24 at least the hydrogen supply is constructed for a
25 closed loop control or can be shut off completely;

26 the apparatus further includes a single stage or
27 multistage turbine (16) connected downstream of the anode
28 side of the high temperature fuel cell, said turbine
29 adapted to convert thermal energy of anode exhaust gas (35)
30 into rotation energy; and

31 the apparatus further includes a gray water evaporator
32 (33) arranged and adapted so that air (20) heated in a
33 condensation process is used for evaporating gray water in
34 said gray water evaporator, a pump (45) arranged for
35 feeding said gray water into said gray water evaporator
36 (33), and a filter arranged for retaining solid and
37 suspended matter out of said gray water.

1 48. (New) The apparatus of claim 47, further comprising a gray
2 water collection tank (32) for collecting used water and
3 unneeded condensate as the gray water.

1 49. (New) The apparatus of claim 48, further comprising a waste
2 water collection tank (28) adapted to collect waste water,
3 and a dehydrator (30) adapted to completely or partially
4 dehydrate said waste water and a thus-gained water portion
5 is fed into the gray water collection tank (32).

1 50. (New) The apparatus of claim 47, wherein any germs and
2 microorganisms present in the gray water (32) are thermally
3 killed.